THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 27. JULY 1, 1944 VOL. 56

The Features of Early Mastitis in Heifers during the First Lactation

by

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The early detection of disturbances of the udder of the milk cow is of considerable economic importance owing to their effects on the quality and yield of milk. Formerly the diagnosis by the veterinarian and farmer of such abnormal conditions was based largely on the observation of changes in the physical condition of the udder, in the general state of health of the cow and in the appearance of the milk. But with the discovery that at least to begin with these disturbances were frequently of such a mild nature as to be unaccompanied by any clinical symptoms in the animal and physical changes in the milk, more refined methods were introduced to enable an earlier diagnosis to be made, which would be highly desirable for the prompt institution of efficient therapeutic measures. These methods have as their object the detection of specific pathogens in the milk or of changes in its biochemical or physical properties, the estimation of its leucocyte content, etc., and differ considerably in their value for diagnostic purposes. Their suitability as tests for mastitis depends not only on their reliability but also on the ease with which they can be applied, where a large number of specimens have to be examined. For the latter reason certain tests, *e.g.*, the determination of the reaction of the milk to brom cresol purple or other indicator, the detection of curd particles in the strip cup, and the estimation of the amount of deposit from the laboratory centrifuge, although only rough indications of abnormal conditions, are widely used.

OBJECT OF THE PRESENT INVESTIGATION

In routine and investigational work on bovine mastitis, we found that the leucocyte content and electrical conductivity tests, when employed together, gave highly consistent results, provided colostrum and end-of-lactation milk were excluded (Abstr. *Proc. Soc. Agri. Bacts.*, 1942). It was also observed that these two tests frequently gave positive results with specimens from which none of the so-called specific mastitis organisms, *i.e., Strep. agalactiae, Strep. dysgalactiae, Strep. uberis,* staphylococci, *Corynebacterium pyogenes* and coliform bacteria, could be obtained by direct plating or enrichment methods. In spite of this, in most cases the abnormal condition of the milk could be definitely attributed to mastitis, as the cows were clinically positive or became so as the lactation advanced. Mastitis organisms, however, were frequently found in specimens taken at a later period. In view of the fact that the culture tests at the onset of the abnormal condition had given negative results, the question arose as to whether the organisms found in the later specimens were actually the primary cause of the condition or merely secondary invaders, and this applied even when the organisms were consistently present. Hence it was considered desirable to carry out the present investigation in order to obtain more information with regard to the aetiology of the disease.

For the investigation a large herd of over 100 animals was selected, 28 of which were heifers about to commence their first lactation, the remainder were cows in the second or a later lactation. The herd was tubercle-free, no animals having given positive reactions to the periodic tuberculin tests over a period of two years. The older cows had also been tested for mastitis by cell count and culture methods about three times in each of the previous four years. Cows with chronic mastitis were not discarded immediately, but retained to keep up the milk supply until they could be replaced by heifers. The herd was self-contained, *i.e.*, recruited entirely from heifers bred on the farm. At the commencement of the experiment about 39 per cent. of the older animals, *i.e.*, the cows in the second or a later lactation, had clinical mastitis, and other 14 per cent., although clinically negative, were giving positive results by the laboratory tests. *Strep. agalactiae* had been found either frequently or occasionally in the milk of 63 per cent. of the *affected* older cows. Various staphylococci were also occasionally present in the milk of the normal as well as the abnormal cows. During the investigation 19 of the older cows and four of the heifers were discarded from the herd. Thus at the end of the observation period the herd consisted of 82 animals, *i.e.*, 58 older cows and 24 heifers at the end of the first lactation (heifers in the first pregnancy which were added to the herd towards the end of the experiment are of course excluded). Of these 82 animals, 33 per cent. had clinical mastitis and 23 per cent., although clinically negative, were giving positive results by the laboratory tests. *Strep. agalactiae* was found in the milk of 50 per cent. of the *affected* animals. Thus the incidence of mastitis in the herd at the end of the experiment was practically the same as at the commencement, but *Strep. agalactiae* was absent from the milk of a greater proportion of the affected animals. Machine-milking was practised, a high standard of cleanliness being maintained in carrying out the milking operations.

Prime importance was attached to the heifers, since in these animals lactation starts in udders which are presumably healthy and therefore evidence of infection which develops may be accepted as primary; thus confusion arising in interpretation of findings from recrudescence may be excluded. All the heifers in the herd, 28 in number, were kept under close observation for the development of clinical symptoms of mastitis or changes in the appearance of the milk, and in addition were examined on several occasions by a veterinary surgeon. For the laboratory tests individual quarter specimens* of milk were taken at regular intervals. The first test was made about ten or twelve days after calving, *i.e.*, after the colostral stage had definitely passed, and the tests were then repeated every fortnight so long as there was no evidence of abnormality; in the case of those which were clinically positive or gave abnormal results by any of the tests, weekly examinations were made as long as the abnormal conditions remained. The specimens consisted of fore milk, excluding, however, the first stream of milk from each teat. They were taken at the evening milking and brought directly into the laboratory so that the culture tests could be commenced within a few hours of milking. The specimens were then kept in cold store overnight and the indirect tests carried out in the morning.

METHODS OF DIAGNOSIS

It is obvious that more information is likely to be obtained and a more accurate diagnosis made if a combination of tests, based on a number of quite different phenomena, are employed, *e.g.* (1) *clinical*—the physical condition of the udder and the general state of health of the cow; (2) *pathological*—the leucocyte content of the milk as evidence of the reaction of the cow to infection; (3) *physical* or *biochemical* properties of the milk—electrical conductivity and chloride content (since the conductivity correlates highly with the chloride content, there is no need to carry out both tests); and (4) *bacteriological*—the occurrence of the so-called specific mastitis organisms in the milk. Consequently the practice adopted in diagnosing the disease was to employ the clinical, leucocyte content, electrical conductivity and culture tests.

Estimation of leucocyte content.—Breed's smear method was used, 0·01 ml. milk being measured by means of a standard platinum loop. The smears were fixed and stained by Newman's reagent, and the number of leucocytes in 30 fields counted with a 1/12 in. oil immersion objective. Where the leucocyte content was high, over five cells per field, *i.e.*, over 1,500,000 cells per ml. (the factor of 300,000 being used), there was no need to count more than ten or 15 fields, provided the cells were evenly distributed. Under the low power of the microscope the uniformity of distribution could be readily observed to begin with and a rough indication of the cell count obtained. As a rule comparatively few organisms were observed in the direct smears even in the case of abnormal specimens.

Estimation of electrical conductivity.—The bridge method was carried out with two similar dip electrodes of such dimensions that they could be inserted readily into the 2 oz. wide-mouthed specimen

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* The different quarters of the udder are indicated as follows: LF—left fore; LH—left hind; RF—right fore; RH—right hind.

bottles containing the samples.* The bottles of milk and also that containing the resistance solution and one electrode were placed in a water bath regulated at 20° C., a short period being allowed for them to attain a uniform temperature. Then the milk electrode was inserted in each sample bottle in turn and the bridge reading determined without removing the bottle from the bath. (Of course this test was carried out after the culture tests had been made, otherwise it would have been necessary to sterilise the milk electrode after its removal from each specimen.) In interpreting the results, the bridge readings were not converted into mhos, the practice adopted being simply to compare the readings of the various quarter specimens from the same animal. In any single normal animal the readings for all quarters were almost identical or varied within 1·5 cm.; of course the absolute readings depended on the stage of lactation, tending to rise toward the end. Where the readings of all four specimens appeared unduly high, comparison would have to be made with recent previous tests of the same heifer. A difference of 2 cm. was regarded as abnormal. The conductivity test was used largely for confirmation, greater importance being attached to the cell count.

Culture tests.—These were carried out with a view to determining the types of streptococci, staphylococci and corynebacteria in the milk.

(1) Direct.—Two large loopfuls of the milk specimens were spread over the surface of a hormone agar plate, and often other two loopfuls were spread over the surface of a blood agar plate. In addition to microscopic examination, subcultures were made from the various types of colonies. Streptococci were grouped by Lancefield's method and also typed according to heat resistance, effect on blood, and action on litmus milk, aesculin, glucose, lactose, mannite, salicin, inulin, raffinose, sodium hippurate, etc. Those which did not belong to Lancefield's Group A, B or C, or to *Str. dysgalactiae* as determined by precipitin tests,† and which had not the cultural and biochemical characters of *Strep. agalactiae*, *Strep. dysgalactiae* or *Strep. uberis*, are referred to as "atypical streptococci." Staphylococcal cultures were typed according to production of pigment, coagulase, haemolysis, fermentation of mannite and liquefaction of gelatin.

(2) Enrichment.—0·5 ml. of the milk or cream was inoculated into peptone and horse heart broth and incubated at 37° C. for 18 hours and examined microscopically. The culture was then stroked on hormone agar and incubated. The colonies were examined as above.

Discussion and Conclusions

Twelve out of 28 heifers according to all the criteria, clinical and laboratory, were free from mastitis throughout their first lactation. As in previous experiments with non-infected heifers, the *leucocyte content* of the milk was as a rule very low, 705 out of 728 specimens, *i.e.*, 97 per cent., having counts of less than 250,000 per ml. The electrical conductivity was also as a rule low, correlating closely with the cell count, and was also practically the same with specimens from all four quarters. As to the bacterial content of the milk, no mastitis steptococci, *i.e.*, *Strep. agalactiae*, *Strep. dysgalactiae* and *Strep. uberis*, were found, even after enrichment, except in the case of one specimen which, although normal according to cell content and conductivity tests, contained *Strep. agalactiae*. This organism was not found in any of the specimens from the same heifer taken during the following six months. *Corynebacterium pyogenes* was absent from all specimens from these twelve heifers; *Staph. aureus* and *albus* were occasionally present, but as a rule could be obtained only on enrichment. The staphylococci were seldom continuously present in specimens from a particular quarter of the udder.

Twelve heifers developed an abnormal condition of the udder in the course of their first lactation as shown by the indirect laboratory tests. In eight of these, mastitis was clinically manifest and in four the condition was subclinical. In three of the clinical cases (Nos. 38, 47 and 86) *Staph. aureus* may have been associated with the disease as it was the only pathogen present in the milk of the affected quarters at the onset of the abnormal condition and was frequently obtained in the later specimens, although mostly in small numbers. In the case of No. 47, *Strep. agalactiae* was found along with *Staph. aureus* on enrichment of one specimen, but this was 14 days after the first appearance of clinical symptoms and the coincident rise in cell count. This streptococcus was not obtained from any other specimen, even on enrichment, throughout the ensuing nine months. *Strep. agalactiae* was also found in the case of No. 86 six weeks after the commencement of the abnormal condition, being obtained on enrichment of the specimens from three quarters. It was not found in any of the specimens taken during the remaining four months of lactation. In the other five clinical cases (Nos. 19, 31, 50, 66 and 74) there was no constant bacterial association. With regard to No. 19, although staphylococci were found as a rule in the specimens from the affected quarter, they were present only in small numbers and varied in type, *Staph. aureus* being found in certain specimens and *Staph. albus* in others. In the case of heifer No. 31, no mastitis organisms were found in the milk of the affected quarter until eight weeks after the initial rise in cell count and conductivity, when *Strep. dysgalactiae* and *Staph. aureus* and *albus* were obtained in one specimen, the first two by enrichment methods only. The heifer became dry one month later, so that only two further specimens were examined and these on enrichment contained only *Staph. aureus* and *albus*. Heifer No. 50 was only three months in lactation and although the milk from several quarters gave positive indirect tests from an early stage in the lactation, *Staph. aureus* was obtained on enrichment of the milk only towards the end of lactation. As regards heifer No. 66, although *Staph. albus* and later *aureus* were found occasionally in the milk of the affected quarter, their presence did not coincide with the initial rise in cell count and conductivity and they were obtained only by enrichment. With regard to heifer No. 74, no mastitis organisms were found at first in the milk from the abnormal quarter, but three months later *Staph. aureus* was obtained on enrichment. It was frequently found on enrichment of subsequent specimens and finally, six months after the onset of the abnormal condition, it was found by direct plating. *Staph. albus* was also occasionally present.

As regards the four subclinical cases (Nos. 9, 11, 18 and 72) two (Nos. 9 and 11) appeared to be associated with *Staph. aureus*. It is noteworthy that in the case of No. 11 one quarter on two occasions in the early part of the lactation gave positive results by the cell count and conductivity tests, although no mastitis organisms could be found in the milk. The same quarter in the seventh month of lactation became abnormal, showing a high cell count and conductivity; the condition persisted to the end of lactation. *Staph. aureus* was found at the onset of the condition by enrichment methods and later directly. The RH milk of No. 18 showed abnormally high cell counts and conductivities during the last few weeks of lactation; *Staph. aureus* and *albus* were found in some of the specimens, but only in small numbers. In the case of No. 72 the initial rise in cell count and conductivity was not associated with the presence of mastitis organisms in the milk, although *Staph. aureus* appeared later and was found consistently in the specimens, but chiefly on enrichment.

Four heifers (Nos. 3, 28, 79 and 99) in the course of their lactation gave abnormal results with the clinical or laboratory tests which could not be definitely attributed to the presence of mastitis. Heifer No. 3, during the first nine months of lactation, appeared to be free from mastitis, although *Staph. aureus* was frequently, and *Strep. agalactiae* more rarely, found in the milk. Neither of these organisms was always obtained from the same quarter. However, just prior to and following an abortion, there was clinical evidence of acute disturbance of all quarters of the udder. Three days after the abortion the specimens of milk from all quarters had high cell counts and conductivities; at the same time *Strep. agalactiae* and *Staph. aureus* and *albus* were found in the milk. Twelve days later the specimens from all quarters were perfectly normal according to the cell count and conductivity tests, and negative results were obtained by both culture tests. All later specimens were also normal, and although *Staph. aureus* and *albus* were occasionally found on enrichment, *Strep. agalactiae* was invariably absent. The heifer was also clinically negative. Three possibilities are suggested here: (1) an acute mastitis which within a few days made a complete recovery; (2) the temporary acute disturbance of the udder was associated with the condition of abortion, whether due to infection with specific organisms, *e.g.*, *Brucella abortus*, or to other causes; (3) the high cell counts and conductivities of the specimens three days after the abortion may have been due to their being colostral in nature. In the case of heifer No. 28, several specimens from a single quarter had high cell counts and conductivities in the early part of lactation, and then the abnormal condition cleared up. *Staph. aureus* was found on enrichment of one of the specimens from the affected quarter. Heifer No. 79 gave abnormally high cell counts and conductivities in the milk of one quarter in the last few weeks of lactation, but no mastitis organisms were found in the milk, except rarely a few staphylococci. This heifer, however, may have calved prematurely and the question of *Brucella* infection cannot be excluded. In the case of heifer No. 99, there was a tendency for the cell counts and conductivities of different quarters to be rather high, particularly towards the end of lactation. This abnormal condition was probably due to the fact that the heifer was a very poor milker and was becoming prematurely dry and yielding "salty"

* The electrodes were supplied by the Mullard Co., two being chosen with the same cell constant. A valve oscillator, attached to the electric mains, was used as the source of current.

† These tests were carried out with sera supplied by the Ministry of Agriculture's Veterinary Laboratory, Weybridge.

milk. *Strep. agalactiae* occurred in one composite sample and *Staph. aureus* was occasionally found, chiefly by enrichment methods.

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In considering these results it must be borne in mind that about 39 per cent. of the older cows in the herd at the commencement of the investigation had clinical mastitis and other 14 per cent., though clinically negative, were giving positive results by the laboratory tests. In 63 per cent. of these affected cows, *Strep. agalactiae* had been found either frequently or occasionally in the milk, while in many of the remainder staphylococci were present. As the heifers were not completely segregated from the infected cows, but simply placed at one end of the byre and milked first, there was a great possibility of the teats of the former becoming infected with *Strep. agalactiae* and pathogenic staphylococci, and, as has been mentioned, *Strep. agalactiae* and *Staph. aureus* and *albus* were occasionally found in the milk of heifers, which were apparently free from mastitis throughout the lactation; these positive bacterial findings were met with at all stages of lactation. It is remarkable that in no case of mastitis developing in a heifer was *Strep. agalactiae* present in the milk at the onset of the disease, nor did this organism persist or occur frequently in later specimens.* In all twelve cases of mastitis in the heifers, including the four subclinical cases, *Staph. aureus* or *albus* was found either occasionally or frequently in the milk of the affected quarters. But it is noteworthy that in five of these animals, no staphylococci or other specific pathogens (streptococci or corynebacteria) could be found even on enrichment of the milk of the affected quarters at the time of the initial increase in cell count and conductivity, which were the first indications of disease. In three of these cases a period of about one month elapsed before staphylococci were obtained; in the fourth, two months; in the fifth, three months. Other workers may claim that the so-called mastitis organisms can almost always be obtained in early cases of mastitis. However, their findings may be influenced by the fact that they are using only clinical and culture tests and not the cell count, and so are not detecting subclinical mastitis at an early enough stage. In the other seven cases of mastitis *Staph. aureus* or *albus* was found in the milk at an early stage of the condition, but the organisms in many instances could be obtained only on enrichment and were occasionally absent from later specimens. In this connection it must be emphasised that in the case of the normal heifers, *Staph. aureus* and *albus* were not infrequently found on enrichment of the milk. Accordingly, where mastitis developed an element of doubt exists as to the nature of the causal agent, even when staphylococci were consistently present in the milk, particularly if they were obtained only or chiefly on enrichment.

It may be objected that uncertainty exists as to whether the initial rise in cell count and conductivity actually indicate the commencement of mastitis. But it has been found previously (Abstr. *Proc. Soc. Agri. Bacts*, 1942) that with acute cases of the disease and even with mild cases definitely diagnosed as mastitis by clinical methods, the cell count of the milk is almost invariably above 500,000 and frequently above 1,000,000, and there is also a marked increase in the conductivity. On the other hand, with animals free from mastitis the milk—excluding colostrum and very late lactation milk—has usually a cell count of less than 100,000 and seldom above 500,000; non-infected heifers have in most instances markedly low cell counts, frequently less than 50,000. Moreover, the fact that specific pathogens cannot be found in certain specimens with high cell counts and conductivities, cannot be taken as evidence that the abnormal condition is not mastitis, because in many cases these indirect tests are confirmed at the time by the clinical condition; or if the abnormalities persist, confirmatory evidence is very frequently afforded later by the appearance of bacteriological or clinical evidence.† Also, the abnormal findings are most frequently restricted to certain quarters of a cow, which shows that the pathological condition is localised and therefore not likely to be due to lactational factors or to some affection of the general health.‡ It must also be remembered that the finding of a specific mastitis organism in the milk is not a criterion of infection, especially if the organisms are found only occasionally and chiefly by enrichment methods. In such cases they may be of extraneous origin or may be present as commensals in the duct system. A reasonable inference from all these considerations appears to be that as regards the heifers showing definite evidence of mastitis or udder disturbance, the initial rise in cell count and in conductivity, which occurred prior to the finding of pathogens in the milk in nearly one half of the cases, were the first indications of the disease, just as the initial rise in cell count and conductivity simultaneously with the appearance of staphylococci in the milk were the first evidences of the disease in the remaining half.

The question then arises as to the aetiology of the disease, because although in the first group of affected heifers just referred to, potential pathogens, *Staph. aureus* and *albus*, were in all cases obtained from later specimens of their milks—in some instances not until two or three months later—these organisms may not necessarily be the primary cause of the condition; and even with the other affected heifers, where they were found in the early stages of the disease, they could not always be detected on enrichment of specimens and in some instances may have been of extraneous origin or secondary invaders. It is arguable that a high cell content and conductivity in milk may be due in certain cases to some factor other than mastitis, which affects the general health of the cow or the functioning of the udder, *e.g.*, a general illness, faulty machine-milking, premature drying-off, etc., but in such cases *all* the quarters are likely to be affected, and the abnormal condition will persist only as long as the particular factor operates and will not develop into typical mastitis. But where only one or two quarters are abnormal, the condition is most likely to be due to a definite infection of these quarters with organisms or to injury. Accordingly, there are two possibilities as regards the primary cause of the disease: (1) In the early stages of the condition the organisms in some instances are largely retained within the tissues and do not pass readily into the milk ducts. However, in two cases of summer mastitis in the older cows of the herd, the causal organism, *Corynebacterium pyogenes*, was detected early in the pus from the udder in which it was present in great numbers. (2) The disease may have been due initially to some unknown agent, specific or non-specific in nature, the streptococci and staphylococci found in the later specimens being secondary invaders, commensals or contaminants, which are enabled to obtain a foothold owing to the abnormal conditions. There was no evidence of infection with other pyogenic organisms, *e.g.*, coliform bacteria. Tuberculous mastitis can practically be ruled out, as the herd has been free from tuberculosis for two years as shown by the periodic tuberculin tests. Although the herd had been vaccinated for contagious abortion, there were a few cases of abortion of unascertained nature, including one amongst the heifers. There is, however, no evidence that *Brucella abortus* is responsible for mastitis of the type under study and so far in this investigation no attempts have been made to find this organism in the milk.

In conclusion, the primary cause of the initial mastitis in these heifers is so far obscure. Certainly none of the organisms to which subacute mastitis is usually attributed was even presumptively implicated except occasionally staphylococci.

Summary

To obtain information as to the aetiology of bovine mastitis, all the heifers (28) in a tuberculin-tested herd of over 100 animals were kept under clinical observation throughout their first lactation, and specimens of milk from individual quarters were examined at weekly or fortnightly intervals for leucocyte content, electrical conductivity and specific pathogens. Twelve of the heifers remained normal and without any evidence of mastitis throughout the lactation, although *Staph. aureus* or *albus* was occasionally found in the milk of one or other quarter, and similarly *Strep. agalactiae* in one instance. Four heifers showed various abnormal conditions of the udder which appeared to be due to lactational or other factors of a non-specific nature. Twelve other heifers developed mastitis or udder disturbances during the lactation, eight being clinical cases and four subclinical. In all, *Staph. aureus* or *albus* was found at some time or other in the milk of the affected quarters, but in only five heifers were these staphylococci found so frequently or in such numbers as to indicate the possibility of a staphylococcal infection. In five of the remaining seven cases no staphylococci could be found even by enrichment methods in the milk of the affected quarters for a period of one to three months after the initial rise in cell count and conductivity, which

* In this respect our results confirm those obtained in an investigation on first and second lactation cows undertaken in Australia (Council for Scientific and Industrial Research, Commonwealth of Australia, Bulletin No. 134, 1940).

† Kennedy (1943) has also recorded that clinical changes in the udder frequently preceded the indication of bacterial infection.

‡ Among the agencies contributory to mastitis, which in our opinion ought to be seriously considered, is the vulnerability of the extremely large lactating udders, which are now a feature of the modern milch cow. An udder which produces sufficient milk for four or five calves, when the normal number of offspring is one, must be regarded as a pathologically hypertrophied organ—its size and pendulous character cannot fail to render it extremely susceptible to physical injuries. In view of the relatively less developed udder in heifers this factor may play a smaller part to begin with than in later lactations.

were the first indications of disease. In spite of the fact that *Strep. agalactiae* was associated with cases of mastitis in the older cows of the herd during the same period and the organism was found occasionally in the milk of the heifers, there were no cases attributable to *Strep. agalactiae* among the heifers. Other specific pathogens (streptococci, corynebacteria and coliform bacteria) were also absent from the milk, and, therefore, the primary agent of infection in these cases remains in doubt.

(For details of all the abnormal heifers see Appendix.)

APPENDIX

Details of Results of Examination of Abnormal Heifers by Clinical and Laboratory Methods

Eight heifers (Nos. 19, 31, 38, 47, 50, 66, 74 and 86) were free from mastitis at the commencement of lactation, but later developed clinical forms of the disease. Further details with regard to these animals are as follows:—

Heifer No. 19.—During the first five months of lactation there was no evidence of mastitis, although *Staph. aureus* and *albus* were found in small numbers in a few specimens from different quarters. In the sixth month the cell count of the LF milk rose to 290,000 and remained high until after two months it had increased to over a million. The conductivity of specimens from that quarter was also high, and the quarter became clinically positive. No mastitis organisms apart from staphylococci were found and these were obtained at first only on enrichment but later in small numbers direct. They also varied in type, *Staph. aureus* being found in certain specimens and *Staph. albus* in others. The other quarters gave negative results to all tests throughout.

Heifer No. 31.—Evidence of an abnormal condition appeared during the ninth month of lactation, LH specimens showing a persistently high cell count and conductivity. The cell count rose finally to over a million. The culture tests of the abnormal milk gave at first negative results, but eight weeks after the onset of the condition, one specimen from the affected quarter yielded on enrichment *Staph. aureus* and *Str. dysgalactiae* and by direct methods *Staph. albus*. Only two further specimens from this quarter were examined as the animal was at the end of lactation. These specimens on enrichment were found to contain *Staph. aureus* and *albus* but not *Strep. dysgalactiae*. *Staph. aureus* and *albus* were also obtained occasionally on enrichment of specimens from the other quarters.

Heifer No. 38.—In the first three months of lactation the cell count of milk from all quarters tended to be rather high—250,000 to 500,000—although with a few exceptions the conductivity was normal. Cultures gave negative results apart from the occasional presence of *Staph. aureus* and *albus* on enrichment. In the fifth month of lactation the cell count of the LH milk rose to over a million, the conductivity was high and *Staph. aureus* was found in direct cultures. This condition persisted to the end of the experiment and the quarter also became clinically positive.

Heifer No. 47.—The RH milk became abnormal five weeks after calving, the cell count being repeatedly above 1,000,000 with the exception of a few specimens with counts of about 500,000 in the later part of the lactation. The conductivity was also high and the quarter became clinically positive. *Staph. aureus* was obtained at the onset of the condition on enrichment only from the milk of all quarters, but no streptococci. A fortnight later *Strep. agalactiae*, as well as *Staph. aureus*, was found on enrichment of the milk from the affected quarter. At all subsequent samplings, extending over a period of nine months, *Strep. agalactiae* was absent, but *Staph. aureus* was frequently obtained on enrichment and occasionally directly. Three weeks after the RH quarter became abnormal, the LH milk had a very high cell count which persisted for four weeks and then became normal again and remained so. The other two quarters were normal throughout the lactation. *Staph. aureus* was occasionally found in specimens from these three quarters, but chiefly on enrichment.

Heifer No. 50.—From the commencement of lactation the specimens from all quarters of this heifer had rather high cell counts, as a rule 250,000 to 500,000, and high conductivities. In the second month of lactation the cell counts of specimens from the two fore quarters rose to over 1,000,000 and in the third month, as the heifer became prematurely dry, specimens from the hind quarters also had high cell counts. At the same time the RF and RH quarters showed induration. The culture tests gave negative results apart from the finding of *Staph. aureus* on enrichment of a number of specimens from different quarters towards the end of lactation.

Heifer No. 66.—In the fourth month of lactation, LH specimens of milk had cell counts of about 250,000 and the counts gradually rose to over 1,000,000 by the end of the lactation seven months later. There were also corresponding increases in the conductivity. Specimens from the other three quarters were normal throughout. The culture tests of the LH quarter gave negative results at the onset of the abnormal condition, although various staphylococci were occasionally found later in this and the other quarters, but as a rule only on enrichment.

Heifer No. 74.—In the third month of lactation the cell count of LH milk rose to 260,000 and 410,000 and later to over 1,000,000. The high cell count persisted to the end of the lactation, eight months later, and the conductivity was also abnormally high. No mastitis streptococci or staphylococci were at first found in the milk from the abnormal quarter, but three months later *Staph. aureus* was obtained by enrichment methods and after another three months by direct methods. *Staph. albus* was occasionally present. *Staph. aureus* and *albus* were also found occasionally in specimens from the other three quarters, but with one exception, only on enrichment. The cell counts and conductivities of these specimens remained normal throughout the lactation.

Heifer No. 86.—In the fourth month of lactation specimens of milk from all quarters of this heifer showed a slight increase in cell count. There was also a marked increase in the conductivity of the LH and RF specimens. In the following three weeks the cell counts were persistently high (240,000 to 600,000) and also the conductivities of the LH and RF specimens. A week later, *i.e.*, in the fifth month of lactation, specimens from the two fore quarters had cell counts of over 1,000,000 and also very high conductivities; this state of affairs continued for the remaining four months of lactation. Before and at the onset of the abnormal condition *Staph. aureus* was frequently found in specimens from different quarters on enrichment; later it was found by direct plating, in some cases in large numbers. *Strep. agalactiae* was found on only one occasion, about six weeks after the onset of the condition, being obtained by enrichment of the specimens from three quarters.

Four heifers (Nos. 9, 11, 18 and 72) were free from mastitis at the commencement of lactation, but later developed an abnormal condition of the udder, as shown by one or more of the laboratory tests, although clinically negative. The following are further details of these heifers:—

Heifer No. 9.—In the fourth month of lactation *Staph. aureus* was found in large numbers by direct culture in the RF milk, and in smaller numbers in the LH milk, although the cell counts and conductivities of all specimens remained normal. In the fifth month of lactation the cell count of the RF milk was 310,000 and at the end of the experiment, *i.e.*, in the sixth month of lactation, it had risen to 620,000. There were also slight increases in the conductivity of the specimens from this quarter, and *Staph. aureus* was frequently obtained by direct plating. The other quarters throughout the lactation gave negative results by all the laboratory tests except that, as already mentioned, *Staph. aureus* was found in one LH specimen. No mastitis streptococci were obtained from any of the specimens.

Heifer No. 11.—At the second week of lactation, although the culture tests gave negative results, the cell count and conductivity of the LH milk were abnormally high, but 14 days later they had both fallen to normal levels. Three weeks later the LH milk again showed a high cell count and conductivity (the cell count being over 1,000,000), although the culture tests still gave negative results. Then the milk again became normal and remained so until the seventh month of lactation, when the count for this quarter gradually increased until by the tenth month it was above 1,000,000 and remained high until the end of lactation. At the same time the conductivity of the milk was abnormally high. In the seventh month, coinciding with the rise in cell count and conductivity, *Staph. aureus* was found on enrichment of the LH milk; later it was obtained always by enrichment and frequently direct from specimens from the same quarter. Mastitis streptococci were absent from this quarter throughout the lactation. The other three quarters throughout the lactation were normal in all respects; no mastitis streptococci were found in any of the specimens, but staphylococci were occasionally present.

Heifer No. 18.—RH specimens taken in the ninth and tenth month of lactation, *i.e.*, within a few weeks of going dry, had extremely high cell counts (over 1,000,000) and conductivities. In the early part of the lactation *Staph. aureus* and *albus* were occasionally found on enrichment of the milk from different quarters and later, when the RH quarter became abnormal, they were found in small numbers in some, but not all, of the specimens from this quarter.

Heifer No. 72.—This heifer was normal during the first five months of lactation, although staphylococci were found in a few specimens, chiefly on enrichment. However, in the six month the cell counts of specimens from all quarters showed a tendency to rise and by the eighth month were in many instances over 5,000,000. Towards the end of lactation the LH milk became normal, but specimens from the other three quarters still had high cell counts. The conductivities correlated closely with the cell counts. Culture tests, direct and enrichment, at an early stage of the abnormal condition gave negative results, but later *Staph. aureus* was very frequently obtained on enrichment and occasionally direct from the milk of all quarters. No mastitis streptococci were obtained from any of the specimens.

Four heifers (Nos. 3, 28, 79 and 99) showed irregularities in the results of the various laboratory tests during lactation, although it was not possible to determine definitely whether they had mastitis or not.

Heifer No. 3.—The clinical, cell count and conductivity tests in the first part of lactation consistently gave negative results, but *Strep. agalactiae* was found in three specimens on enrichment, although not always in milk from the same quarter. *Staph. aureus* was also frequently obtained by enrichment methods. In the tenth month of lactation, and while giving two gallons milk daily, the whole udder became swollen and the milk abnormal and highly coloured. Laboratory tests, however, were not carried out. The heifer aborted two days later. After three days an examination of the milk by direct methods showed the presence of *Strep. agalactiae* and *Staph. aureus* in one quarter, and *Staph. aureus* and *albus* in two other quarters; the specimens had also high cell counts and conductivities. On testing twelve days later and on subsequent occasions during the remaining two months of the experiment it was found that the cell counts and conductivities had fallen to normal levels and showed no further tendency to rise; also *Strep. agalactiae* was invariably absent and *Staph. aureus* and *albus* were only occasionally found on enrichment.

Heifer No. 28.—The specimens of milk from this heifer were normal throughout the lactation apart from two LH specimens taken in the third and sixth week of the lactation, which had very high cell counts and conductivities. The cause of the temporary abnormal condition could not be determined, although *Staph. aureus* was obtained on enrichment of the second abnormal specimen. Later in the lactation staphylococci were occasionally obtained, but not always from the same quarter.

Heifer No. 79.—This heifer may have calved prematurely as she was only five months in lactation. The RH specimens had as a rule rather higher cell counts (in one case over 1,000,000) and conductivities than those from the other three quarters, but apart from the finding of staphylococci in a few specimens, chiefly on enrichment, the culture tests were negative.

Heifer No. 99.—This heifer was a poor milker. Specimens taken within eleven days of calving had very high cell counts and conductivities and were found to contain staphylococci on enrichment. The heifer was then suckled by calf for a month. During this period, two composite samples of milk were examined. These had comparatively low cell counts and conductivities, but the first sample on enrichment was found to contain *Staph. aureus* and the second *Strep. agalactiae*. Specimens from individual quarters taken a week later had low cell counts and conductivities and only *Staph. aureus* could be obtained on enrichment. The heifer was then returned to the herd and although the cell count during the remaining five months of lactation occasionally tended to rise (as a rule to about 250,000 or 300,000) and the conductivity to be rather high, there was no definite evidence of mastitis. No mastitis streptococci were found in these individual quarter specimens but *Staph. aureus* was occasionally present.

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Bull, L. B., Murnane, D., Munch Peterson, E., MacLean, J. P., and Clark, S. E. R. (1940.) (*Bull. Counc. sci. and ind. Res. Aus.* No. 134.)

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Weekly Wisdom

It is the sacrifice of the scientific treatise to discharge its burden into the stream of knowledge and then to be itself consigned to the cockloft.—Clifford Allbutt, "Notes on the Composition of Scientific Papers."

CLINICAL COMMUNICATIONS

Removal of a Foreign Body from Thoracic Portion of Oesophagus in a Dog

S. F. J. HODGMAN, M.R.C.V.S.,
Shortlands, Kent

Subject.—A two-year-old Cairn terrier bitch.

History.—Had swallowed a bone and for four weeks had shown symptoms of pain a few seconds after eating any solid food, but could swallow liquid without much apparent distress.

Examination.—On examination was found to be in very poor condition and obviously very hungry. X-ray revealed what appeared to be a dilation of the oesophagus behind and to the left of the heart. Later another X-ray was taken following the administration of a barium sulphate suspension. This latter revealed the presence of an elongated bone at the dilated portion of the oesophagus.

Treatment.—After anaesthesia with nembutal a metal oesophagoscope was passed *via* the mouth. Instrumentation was not easy or satisfactory so it was decided to try again with the aid of the fluorescent screen. By this means it was found easy to obtain a safe purchase on the bone. This proved to be too large to pull up through the lumen of the tube; it was therefore pulled up against the open end of the oesophagoscope and both were drawn slowly out of the oesophagus as one unit. The obstruction was found to be an irregularly triangular piece of cancellous bone, 1¼ by 1¼ by ½ inch.

Some 15 minutes after the removal of the bone the bitch stopped breathing; this was followed by cessation of the heart's action. Artificial respiration and an injection of adrenaline tartrate (1 : 1,000) 0·2 c.c. was given intracardially. This worked almost at once, and 35 minutes later spontaneous respiration was resumed.

Observations.—Points worthy of note are:—

(1) The length of time during which the bone remained in the lower part of the oesophagus was 30 days and yet the bitch recovered extremely rapidly, eating normally within 48 hours without pain.

(2) The advisability of using an oesophagoscope the tube of which is of a sufficiently large calibre.

(3) Lastly, the great aid of a fluorescent screen.

Since the above case I have had three other cases of oesophageal obstruction to deal with, all in the thoracic region, the subjects being one cat and two dogs. I attempted to remove two without the aid of the fluorescent screen and both died. The other survived.

* * * * *

A Case of Unduly Prolonged Anaesthesia

JOAN CHAPLIN*

Subject.—A three-months-old kitten, to be spayed.

15.4.44.—Less than 1 gr. nembutal was given intravenously, and the kitten went under the anaesthetic without any trouble. The operation was performed, the wound powdered with M. & B. 693, and the incision sutured within about ten minutes. The kitten was wrapped in a blanket and put back in its cage at about 5.30 p.m.

9.00 *p.m.*—The kitten had apparently stopped breathing. Coramine (1 c.c.) was injected immediately and respiration and heart action recommenced at once.

16.4.44.—6.30 *a.m.*—The kitten had apparently stopped breathing again, and no heart sounds could be heard, even with a stethoscope. Ten drops of picrotoxin were injected and breathing and heart action were restored.

8.30 *a.m.*—Convulsions began, as a result of the picrotoxin, and continued all day. 50 c.c. glucose-saline were given subcutaneously at about four-hourly intervals. The bladder was emptied by manual pressure.

17.4.44.—The convulsions ceased. The kitten was completely unconscious. Glucose-saline was given as before and the bladder again emptied.

18.4.44.—Unconsciousness continued, but in the evening the prick of the needle when the glucose-saline was injected was seen to produce a very slight reaction and caused the kitten to lick its lips. No eye reflexes were obtainable. The bladder was emptied again.

19.4.44.—Unconsciousness appeared to be slightly less deep. Responses were observed at each injection of glucose-saline. In the evening an incomplete response to a light shone on the pupils was observed. The bladder was again emptied manually.

20.4.44.—The kitten was attempting to get to its feet, and in the afternoon succeeded in doing so. It lapped up, of its own accord, about half a saucer of milk.

In the evening it was moving about, more or less steadily. For the first time spontaneous urination occurred.

The stitches were removed from the wound, and the kitten was discharged in good health on the following day.

[Summary]

1. This kitten was completely unconscious for four days, during which time no urine was passed spontaneously, though on the fourth day some reflexes were observed.

2. When consciousness returned, it did so rapidly and completely, the kitten showing no ill effects whatsoever.

3. No satisfactory explanation of this prolonged period of unconsciousness has yet been offered.

[The kitten is now in perfect health (18.5.44) and has shown no ill effects whatsoever.—John A. Dall.]

* Fourth year student, Royal Veterinary College. Case seen in practice with Mr. John A. Dall, B.Sc., M.R.C.V.S., Torquay.

ABSTRACTS

[Toxic Effects in the Feeding of Cocoa Meal to Pigs. Braude, R. (1943.) *Vet. J.* **99**. 302-307. (Nat. Int. Res. Dairying, Shinfield.)]

Feeding trials were conducted with Wessex Saddlebacks and Large Whites, initially 14 to 15 weeks of age. The cocoa meal contained about 2·5 per cent. of theobromine, and was found to be valueless as a feeding-stuff. In amounts equivalent to 7½ per cent. of the ration, or more, it produced definite retardation of growth, followed by inappetence, lethargy, scouring and death. There were other symptoms which were presumably attributable to secondary infection, and *post-mortem* examinations (conducted by Dr. N. S. Barron) showed marked pulmonary lesions. There was no evidence of toxicity in animals to which 5 per cent. of cocoa meal was fed, but it is suggested that the duration of the experiment (24 weeks) was insufficient for the toxic effects to have become manifested. A. N. W.

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[Studies of the Toxicology of Phenothiazine in Horses and Mules. Woolf, F. P., and Simms, B. T. (1943.) *N. Amer. Vet.* **24**. 595-599.]

After giving a brief review of the work of previous investigators on phenothiazine medication of equines, the authors record experiments carried out with the three-fold purpose of determining (1) the relation of diet to toxicity of phenothiazine in horses and mules, (2) the relation of repeated dosage to toxic manifestations, and (3) the toxicity of two lots of the drug from different sources. Five horses in fair to good condition, except one, and five mules all thin and somewhat anaemic, except one, were used; all the animals were mature and all were fed, the diet being tested for not less than 28 days before and not less than 30 days after treatment. The animals were given two diets: (*a*) unground white corn and (poor grade) No. 3 Johnson grass hay, and (*b*) whole oats and No. 2 leafy alfalfa hay. Two horses received 6 gm. and all other animals 5 gm. of the drug per 100 lb. body weight. Percentage volume of packed red cells, sedimentation rates, and haemoglobin content of blood were determined and red cell and total and differential white cell counts were made at frequent intervals before and after treatment. Analysis of the results of the tests shows that horses on diet (*a*) developed anaemia and icterus after medication, while horses on diet (*b*) developed no anaemia and no icterus. The mules did not become anaemic or icteric, regardless of their diets. There were ten instances of repeated treatment, the shortest interval between treatments being 25 days and the longest 116 days; both horses and mules showed no indications of being either more or less susceptible to subsequent treatment with the drug. No difference was found in the toxicity of the two lots of phenothiazine tested and which were produced by different companies. J. N. O.

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[The Survival of the Infective Larvae of the Common Ruminant Stomach Worm, *Haemonchus contortus*, on Outdoor Grass Plots. Dinaburg, A. G. (1944.) *Amer. J. vet. Res.* **5**. 32-37.]

Because of the diversity of the conclusions reached by other authors on the survival period of infective stomach worm larvae, Dinaburg describes the materials, methods and results of experiments designed to determine the effect of outdoor exposure at different seasons upon the survival of known numbers of infective *Haemonchus contortus* larvae on grass plots. The tests were carried out at Beltsville, Maryland, the plots being examined in most cases at fortnightly intervals, and the inoculum varied from 24,800 to 306,000 infective larvae per plot. The period and degree of survival of the larvae, as measured by the percentages recovered, varied in the different experiments. In all, there was a more or less rapid decline from the proportion recovered after the first two weeks to less than 1 per cent. of the inoculum, and thereafter

a persistence at this low level until no more larvae were recovered. This decline to less than 1 per cent. occurred after 14 to 28 days in summer, 27 to 41 days in winter, 42 to 56 days in autumn, and 56 to 70 days in spring. No larvae were recovered after exposures of 42, 83, 98 and 316 days in the summer, winter, spring and autumn experiments respectively. It is noted that these figures, because of losses during recovery, represent minimum estimates of the survival of the larvae outdoors, and it appears that the extreme weather conditions of summer and winter are less favourable to survival of the larvae than the conditions of spring and autumn. Of the two weather conditions measured, the amount of rainfall did not bear any direct relationship to the period and degree of survival, but the maximum air temperature did. A lamb allowed to graze for nine days on two plots containing infective larvae which had been exposed for 266 days since autumn failed to become parasitised. Since migration of the larvae might influence their survival, information on their horizontal and vertical distribution was obtained and of all larvae recovered in the four experiments, 43 per cent. were found on the grass, 24·2 per cent. on the surface soil, 32 per cent. in the first inch of soil (this percentage being inflated by two exceptionally high recoveries), and 0·8 per cent. in the second inch. The horizontal migration of the larvae was comparatively slight. J. N. O.

QUESTIONS IN PARLIAMENT

Medical Research Council (Developments)

Mr. Salt asked the Lord President of the Council whether any plans are under consideration for expanding the research programme of the Medieal Research Council as regards medicine and all related fields as soon as circumstanees and available personnel allow; and whether he is satisfied that it has, or will have, sufficient funds available for the purpose.

Mr. Attlee: Yes, Sir. Various plans are under consideration and the Medical Research Council have already been able to initiate certain new schemes with a view to development as soon as circumstances permit. Among other things, they have recently established a Research Unit in Applied Psychology at Cambridge; and Research Units in Industrial Medicine, Human Nutrition and Otology in London. The new buildings for the National Institute for Medical Research, completion of which has been interrupted by the war, will also make it possible to expand the Council's central establishment. The Government have already stated their intention of giving full support to research work.

Colonial Empire: Nutrition Policy

Mr. Creech Jones asked the Secretary of State for the Colonies whether further action is being taken by his office in the matter of malnutrition in the Colonies; and whether he can make a statement on plans and policy.

Colonel Stanley: Yes, Sir. For some years now Nutrition Committees have been functioning in a large number of Colonies and many of them have done valuable work. Following on the resolution of the Hot Springs Conference I communicated further with Colonial Governments as to their nutrition policy. Also the Medical Research Council have recently formed a Human Nutrition Research Unit which, under the direction of Dr. B. S. Platt, is engaged in investigations on Colonial nutrition and is offering hospitality for study and research to nutrition workers from the Colonies. The unit will also be ready to advise Colonial Governments on technical questions and its formation is a first step towards a wider organisation which, it is hoped, will include both teaching and research in its scope. I hope also that in the near future Dr. Platt will again visit certain Colonial territories for the purpose of investigating the position and advising on future plans.

Hot Springs Conference (Resolutions)

Mr. John Dugdale asked the Secretary of State for the Colonies what action has been taken within the Colonial Empire to carry out the recommendations of the Hot Springs Conference.

Colonel Stanley: His Majesty's Government undertook to commend the resolutions of the Hot Springs Conference to the Governments of the Colonies, Dependencies and Overseas Territories. This has been done and replies have been received from nearly all the Governments concerned. The general sense of the replies is that the Governments accept the broad aim of the resolutions and the obligation to give effect to them in so far as they are applicable in local conditions. I am afraid I could not enter into details within the scope of a reply to a Question, but I may mention that the implementation of the resolutions of the Conference is being considered in many of the Dependencies in connection with plans for post-war development.

Questions and Answers

"Questions and Answers" will be published on alternate weeks.

The submission of questions for inclusion in this column will be welcomed. They can relate to any aspect of veterinary work and where publication of the name of the enquirer is not desired, a pseudonym should be supplied, the name and address also being given.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Retained Placenta in the Mare

Q.—*How much time should elapse before manually removing retained placenta in the mare?*—"*Uncertain.*"

A.—Opinions vary: generally speaking, eight to twelve hours. Cases have been encountered where the placenta has been left for 24 hours or more without harmful effects, and occasionally dead and decomposed foetuses have been removed, and no ill effects observed. The use of sulphanilamide *in utero* seems to be a useful therapeutic measure to prevent metritis.

Aural Haematoma of the Cat

Q.—*Is there any known successful method of dealing with aural haematoma of the cat?*—"*M.R.C.V.S., Swiss Cottage.*"

A.—Admittedly this is a very difficult matter, the obstacles to 100 per cent. success in the cat being increased by the shortness and erectness of the concha. The resentment of a determined cat can only adequately be overcome by general anaesthesia (which in these days is so easily induced), and under which so much better work can be performed without frightening or hurting the animal. A bold (elliptical) opening is favoured, all clot, blood and serum being removed. The essential factors for the prevention of deformity are (1) to avoid removing too much tissue in making the incision elliptical, and (2) the maintenance of even pressure after operation until such time as further haemorrhage or serous exudate ceases.

One aims at preventing the refilling of the cavity by keeping the two layers of the concha flat and in close apposition. The late Henry Gray sought to effect this by the application of his perforated aluminium ear-clamp. The writer modified this appliance in several important particulars, but even as so improved, it still failed to give the consistently good results expected of it unless the most meticulous care was devoted to its correct fitting. Undoubtedly many cases have healed perfectly by its use, the chief difficulty lying in its daily removal and re-application (the lesion being intensely painful) and the necessity for guarding against pressure necrosis. One is probably well advised to inject a ring of local anaesthetic around the base of the ear before attempting subsequent treatments.

The desired pressure can be obtained to a certain extent by passing sutures at intervals right through the concha from the external to the internal surface, crossing the incision, and returning from the internal to the external surface, the knot being tied in the latter position. This method, however, undoubtedly sets up an increased irritation, whilst partial refilling occurs in the spaces between the sutures, and in positions where no sutures have been inserted.

The method of laying the ear flap between two layers of lint on top of the head and firmly bandaging, which is so successful in the case of dogs, cannot be attempted in the case of cats. Self-mutilation in either animal is best prevented by the application of a loose string-net bag, as although preventing shaking or scratching of the ear, it permits the access of air and allows the ear to keep cool. The external auditory meatus should be plugged with cottonwool to prevent discharge from running in and becoming stagnant.

Significance of Albuminuria in Nephritis

Q.—*Is albuminuria to be regarded as definite diagnostic evidence of nephritis?*—"*Enquirer.*"

A.—Actually, no, since there are other causes for the appearance of albumen in the urine; but it is a highly suggestive symptom, and in the absence of a microscopical examination of the urinary sediment for cells and casts, it must be considered in conjunction with the objective symptoms and the history of the case, age of the animal, etc. The discovery of renal cells and casts, plus the continued presence of albumen, would be diagnostic of nephritis. It should not be overlooked, too, that the latter may exist whilst no albumen is yet discoverable in the urine.

To be properly grounded, the veterinary practitioner should be familiar with the history of his profession and with the origin and development of the livestock industry which it serves. A study of these will strengthen his confidence in himself. It will convince him that veterinary service is indispensable and that without it present civilisations would crash.—*Vet. Med.*

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

July 12th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

July 13th.—Meeting of the British Society of Animal Production, at the London School of Hygiene and Tropical Medicine, 10.30 a.m.

July 21st.—Meeting of the Mid-West Division, N.V.M.A., at Bristol (Royal Hotel), 2.30 p.m.

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N.V.M.A. Meetings Postponed

The attention of members of Council and of the Committees concerned is drawn to the fact that it has been found necessary to postpone, to a date to be announced later, the meetings of Council and Committees, N.V.M.A., called for July 10th and 11th.

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PERSONAL

Appointment.—The Council of Reading University has appointed Mr. H. G. Sanders to the Professorship of Agriculture in succession to Professor Rae.

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Birth.—Chesney.—On June 5th, 1944, to Evelyn, wife of R. W. L. Chesney, M.R.C.V.S.—twin daughters.

. . . . . .

University of Edinburgh Doctorates

At the Graduation Ceremony of the University of Edinburgh, held on June 23rd, 1944, the following former students of the Royal (Dick) Veterinary College received Doctorates:—

Degree of Doctor of Science (D.Sc.) in the Department of Veterinary Science.—David Richardson Wilson, B.Sc., M.R.C.V.S.

Thesis: "Studies in Louping-ill, with special reference to Immunity and the possible application of Tissue Culture-Virus in active Immunisation."

Doctor of Philosophy (Ph.D.) Faculty of Science.—Archibald McDiarmid, M.R.C.V.S.

Thesis: "A Study of Enzoötic Staphylococcal Infection in Lambs, with special reference to Pyaemia associated with Tick-bite."

Israel Zlotnik, Vet. Surg. (Warsaw), M.R.C.V.S.

Thesis: "A Comparative Study of Spermatogenesis and Oögenesis in Dog, Cat, and Rabbit."

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R.C.V.S. OBITUARY

Macfarlane, Alexander Menzies, M.B.E., M.R.C.V.S., of Villa Dunalistair, Tarxien, Malta. Graduated Edinburgh, May 12th, 1894. Died June 9th, 1944; aged 80 years. Served as Government Veterinary Surgeon and Superintendent, Civil Abattoir, Malta, between January 16th, 1899, and March 7th, 1929.

A Tribute

Mr. H. Hirst, Assistant Director of Agriculture, Ghammieri, Marsa, writes: "Mr. Macfarlane devoted his life to the betterment of the livestock industry in Malta. He has been in Malta almost continuously for the past 45 years and during that period he has proved a good friend to all livestock owners. He has been closely associated with the Malta Racing Club and was especially noted for his skill in the treatment of equines. By his death Malta has been deprived of an experienced veterinarian who could always be relied upon to help the poor peasantry in their livestock troubles."

* * * * *

CLEAN MILK PRODUCTION

"Although Mr. Hudson had a stormy passage in the House of Commons with his Food and Drugs (Milk and Dairies) Bill," writes the Agricultural Correspondent of *The Times* in a recent issue, "dairy farmers themselves are not greatly worried about the prospect of the Ministry of Agriculture taking over responsibility for the inspection and registration of dairy farms. Some local authorities have been strict and others lax.

"Too much stress can be put upon the type of cowhouse and equipment. A good water supply is essential, but the most important factor in clean milk production is the standard of hygiene which the farmer himself sets. Clean milk can be produced in the poorest sheds, and contaminated milk can come from palatial dairy buildings. Certainly it is easier to maintain a high standard if the buildings and facilities are convenient.

"A good criterion is the keeping quality of the milk. Since 1942 the Government have been pushing the National Milk testing and advisory scheme. The idea is to test for keeping quality all milk arriving at collecting centres and creameries, and to give advisory help to any farmer or depot whose methods of producing and handling milk call for improvement. To-day the milk of over 75 per cent. of all milk producers in England and Wales is being examined for keeping quality once a fortnight. Specialist advisers are sent to producers whose milk is unsatisfactory and dairies are kept up to the mark about the cleanliness of churns returned to the farm.

The original purpose of this scheme was to overcome the waste through souring which occurred in 1940 and 1941. Milk production has been given high priority in war-time farming, but it is not enough to produce more milk if part of it has to be thrown down the drain. Recent records show that the keeping quality of milk has improved during the last two years in spite of the war-time lack of skilled workers and transport delays.

"The testing of all milk and the more regular inspection of dairy farms should give the country clean milk at the first stage in its journey to the consumer. Clean milk and safe milk are not necessarily the same. In this country we have a long way to go before bovine tuberculosis and other diseases are eliminated. As soon as conditions allow this problem must be tackled much more vigorously. Pasteurisation may safeguard the consumer, but it does not repay the producer for the losses he incurs."

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ARTIFICIAL INSEMINATION OF CATTLE

A National Service

The Minister of Agriculture and Fisheries has recently arranged for a review of the principles on which the development of artificial insemination centres in England and Wales should be planned and controlled under the powers conferred upon him by Section 17 of the Agriculture (Miscellaneous Provisions) Act, 1943. Discussions have taken place with the National Cattle Breeders' Association, the National Farmers' Union and the Milk Marketing Board and it is proposed to make the following arrangements for the future development of the artificial insemination of cattle in this country.

It is considered that artificial insemination centres should be controlled and developed as a national service on behalf of the livestock industry and that, with the exception of centres established for experimental purposes, licences for such centres should be granted in future only to organisations controlled and financed by producers, such as the Milk Marketing Board, farmers' co-operative societies and the Cattle Breed Societies. It would be a condition of the licence that the centre would be available to all producers of cattle within the area of operation.

Experience in this country and abroad has shown that adequate capital resources and proper organisation and business management of centres are essential. It is accordingly intended that the tissue of a licence shall be conditional upon the appointment of a competent local Committee, representative of breeders and farmers in the area, to advise on all matters affecting the working of the centre.

A Central Advisory Committee is being appointed to advise the Minister upon the economic aspects of the control and development of centres and to consider applications for licences to set up such centres. The Chairman and eight members are being appointed by the Minister and four members each by the Milk Marketing Board, the National Farmers' Union, and collectively by the Cattle Breed Societies. The personnel of the Committee will be the subject of a further announcement.

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COMMITTEES ON AGRICULTURAL EDUCATION

The Minister of Agriculture and the President of the Board of Education have jointly appointed a permanent committee to advise them on "all aspects of agricultural education to be provided by local education authorities, and particularly on the educational policy and methods of training to be adopted at farm institutes." A further committee has been set up by Mr. Hudson "to consider the character and extent of the need for higher agricultural education in England and Wales" and make appropriate recommendations. This second committee is to be concerned with education above the farm institute level and will take over the functions of the war-time Committee on Higher Agricultural Education. Both committees will have as their chairman Dr. Thomas Loveday, Vice-Chancellor of Bristol University, who presided over the deliberations of the Committee on Veterinary Education in Great Britain.

Abattoir Management in Poland

In a communication recently received Dr. Alfred Ginsberg, of the Veterinary College, Lwów, Poland, gives an interesting picture of abattoir conditions and the relationship of the veterinarian to meat inspection in Poland. Much that he records as having been done in pre-war Poland is what we, in this country, have for long envisaged and been striving to bring about.

In 1934 the Polish Ministry of Agriculture was empowered by law to prohibit the use of private slaughterhouses in urban areas; later, in 1936, as a result of the findings of a special survey committee, any abattoir which served a population of more than 5,000 was to be under the supervision of a veterinary surgeon only.

The best conducted concerns proved to be those in which the manager was a veterinary surgeon. On the other hand, slaughterhouses under the management of a layman lost more or less their original function, being primarily a meat factory and not a sanitary station. In 1939 only two large abattoirs still remained under the administration of a layman.

The Government were planning the institution of special courses, whereby veterinarians desiring to enter meat and food inspection could be properly trained in meat-marketing, slaughterhouse administration and meat and food hygiene.

Other cogent reasons for linking up veterinary personnel and abattoir work are also given by Dr. Ginsberg. One in particular is in connection with the planning and construction of new buildings. To avoid unnecessary expenditure it was considered advisable to obtain the advice of a veterinarian and to have him supervise the construction, the authorities being fully aware of "the relationship of hygiene to the meat trade."

On general grounds it was considered an advantage to introduce a system of grouping of the meat industry. There would, for instance, be facilities for the killing of all the different domestic animals including rabbits and poultry, for carrying out the necessary procedure involved in tinning and packing and for preparing all the marketable products including the by-products at one centre.

Dr. Ginsberg expresses his appreciation of the kindness shown to him by his veterinary colleagues in this country, especially Major Brennan De Vine, Mr. C. G. Allen, Lieut. Colonel Anthony and also Mr. Swadkins, whom he met during a visit to Birmingham with Polish veterinary students.

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CHEMISTS AND VETERINARY MEDICINES

"A recent leader in the *Journal* (p. 183), and a subsequent reference by 'Onlooker' (p. 199), on the sale of veterinary, biological and chemotherapeutic drugs have been markedly one-sided in their treatment of the subject," writes Mr. C. D. Fraser, of Harrogate, in the issue of the *Pharmaceutical Journal* of June 10th. "Surely," he continues, "the analogy between the right of the retail pharmacist to meet the medical needs of human patients and those of the farmyard is one which cannot, in terms of present-day practice, have more than superficial justification. The following points may help chemists to see the position in a more complete light:—

"1. The human patient may not purchase Schedule IV poisons other than on the prescription of a qualified practitioner, who is responsible for the use of the drug and the progress of the patient under treatment.

"2. The farmer, by virtue of his business interest, may, through the retail pharmacist, purchase Schedule IV poisons on a declaration that they are required for animal treatment only. In such cases the signature of the farmer is as valid in the eyes of the law as that of a doctor, dental surgeon or veterinary surgeon. This is where the analogy breaks down, and breaks down very badly indeed.

"3. 'Onlooker' suggests that veterinary surgeons are deprived of the facility of obtaining their supplies through local pharmaceutical sources. On behalf of how many pharmacists is this appeal being made? One might make bold to say that in all but the most exceptional instances the retail pharmacist has taken deliberate action to side-step the veterinary surgeon by concentrating on direct sales to farmers of a large variety of packed counter adjuncts, of little or no value, and with even less knowledge of the actual conditions for which the nostrums were prepared.

"4. The trend of veterinary medicine must have been obvious to all observing pharmacists during the past 20 years, and what have we as a body done to take a full and proper part in dealing with problems of animal health in this country? As far as I can see, the answer is to be found in beautician, chiropodist, optician and photographic signs associated with pharmaceutical premises throughout the length and breadth of the land. Until we can claim some real knowledge of veterinary therapeutics to enable us to take a full and intelligent part in this branch of medicine, I think it would be better for us to stick to what we really do know, and allow the veterinary surgeon, by virtue of his specialised training, to care for, and administer to, the needs of the many and varied domestic animals."

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BRITISH SPORTING PICTURES

Mr. Frank Lambert, the Director of the Walker Art Gallery, Liverpool, writes in a recent issue of *The Times*: "On February 15th Mr. Walter Hutchinson announced in your columns his generous intention of founding in London a national gallery of British sports and pastimes, to be gathered about the nucleus of two paintings by George Stubbs and 40 other pictures which he had just purchased. You gave your blessing to the proposal in a leading article on February 19th.

"Your readers may therefore be interested to know that a gallery devoted to the pictorial illustration of the same subjects will be established in the provinces after the war, though it will not, as Mr. Hutchinson intends, be a separate institution but a new department of one already famous for its collection of works of art. The Corporation of Liverpool has just accepted for the Walker Art Gallery the bequest of the Walter Stone collection of sporting pictures, which comprises 85 paintings of shooting, hunting and racing subjects and includes works by Henry and Samuel Alken, H. B. Chalon, J. F. Herring, J. N. Sartorius, Dean Wolstenholme, and others; it is appropriately rich in works by the Liverpool artist, Charles Towne.

"This valuable collection would enhance the interest of any British gallery of art. It provides, however, only the nucleus for the complete representation of its subject-matter, because such typical English sports as cricket, boxing, fishing, and so on, and such well-known painters as George Stubbs (another Liverpool artist), Ben Marshall, James Ward, and others are not included. The Walker Art Gallery, having been requisitioned, is closed for the duration of the war, but when in due course it reopens the committee which administers it will have in the Walter Stone collection the starting-point for a scheme similar to, and in friendly rivalry with, that of Mr. Hutchinson. It is one of the conditions of the bequest that it shall be kept in a separate room; but that is no reason why pictures of the same genre should not be exhibited in adjoining rooms, so as to make ultimately a comprehensive gallery, within the Liverpool permanent collection, of British sporting art. It is no criticism of Mr. Hutchinson's project to suggest that if a gallery of this kind is justifiable at all, then there is scope for it in the provinces as well as in the Metropolis."

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MINISTRY OF AGRICULTURE NEWS SERVICE

Ley Management.—Many long ley mixtures, sown down in the spring of 1943, are now coming into their first productive year. Whether or not these long leys should be grazed or mown this year, is a question depending upon circumstances. If one is considering the ley and its future productivity as a pasture from the viewpoint of what is best for the ley, then the wiser policy is to graze. But it must be remembered that the ley is not an end in itself but is valuable to the extent to which it helps in the economy of the farm. If a hay crop is most urgently wanted, and there is no reasonable alternative field, then the ley must be used for that purpose.

Allowing the young ley to run up to a hay crop in its first year encourages the growth of the early growing and short-lived species such as Italian Ryegrass and Red Clover at the expense of the more permanent grasses and clovers. In taking a hay crop, therefore, everything possible should be done to counteract this drawback. Graze off the earliest growth so that the short-lived species do not get too long a start over the later species. Do not wait for a heavy, over-ripe crop of hay, but cut as young as possible and graze the aftermath well.

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Penicillin Production in U.S.A.—The production of penicillin, the new and powerful drug that is playing such an important part in treating war wounded, is now, to some extent, dependent on farmers. Dr. Robert D. Coghill, of America's Northern Regional Research Laboratory, found that the best diet for the mould that produces the drug comes from agricultural products. One of these is maize steepings and another lactose sugar, a product of cows' milk. The result of this discovery was that penicillin could be produced in sufficient quantities to make its manufacture of interest to commercial chemists and over 15 firms are now producing the drug.

Penicillin production in the United States has increased from 425 million units in June, 1943, to more than 18,000 million units in February of this year and the price has dropped from 20 dollars to 3½ dollars per 100,000 units, a reduction of 84 per cent. in

year. In a few months' time production capacity will be about 9 lb. of pure penicillin a day, sufficient to treat 250,000 serious cases a month.

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Lucerne Finds the Water.—That lucerne plants can withstand any drought likely to occur in Britain has been confirmed at Woburn Experimental Station, Herts. There a well established stand of lucerne sent its roots down as single ropes to about 2½ feet. The soil was then penetrated by the roots to about 5 feet. At that depth they met a layer of limonite they were unable to break through and there they formed a mass of fibrous roots. In America there are records of lucerne drawing its water from a depth of 33 feet.

The productivity of lucerne on the light but deep soils in England is demonstrated by a field at Woburn on which lucerne has been growing for eight years and with the exception of the first, second and eighth years it has given three cuts a year. The total crop per acre in eight years was 30½ tons of hay with an average protein content of 15¼ per cent.

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Salting Hay.—The feeding value of hay depends to a large extent on the weather and the care with which the hay is made. Mould and overheating the stack can be minimised by the use of ordinary agricultural salt sprinkled during stacking at the rate of 20 lb. to 40 lb. per ton of crop. Hay treated in this way can be stacked 12 to 24 hours after cutting if the weather is fine, thus reducing the risk of damage from exposure to rain and hot sun. Salt treatment also gives increased palatability and wastage in feeding is insignificant.

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Kenya Butter.—Ten years ago Kenya's annual butter production was about 1'120,000 lb. It is now nearly four times as much. After the war, when there will be a substantial reduction in Service requirements, it is expected that Kenya will export some 250 tons of butter a month.

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THE METRIC SYSTEM

In a recent issue *The Pharmaceutical Journal* comments as follows on the proposal made in a publication issued by the Decimal Association that the Government should include in their reconstruction programme the decimalisation of our coinage and the adoption of the international system of weights and measures. "Unless these changes are made, they say, we shall be heavily handicapped in our endeavours to re-establish our export trade with most countries. The metric system, we are reminded, has been adopted by the whole of continental Europe, all South America and important parts of the Middle East. It used to be said that its claim to be accepted as a truly international system could not be established until the attitude of Russia and the Far East had become known. The answer to that reservation is now available—Russia and Japan have already adopted it and China has declared her intention to do so. There is a strong body of opinion in the British Dominions in favour of the change to the metric system. Scientists in all countries have adopted it as the basis of their work. On these grounds the Decimal Association makes out a good case and one which is reasonably put. We as pharmacists, however, have a closer interest in the metric system. For all processes, chemical and pharmaceutical, the metric system of weights and measures is employed in the B.P. 1932. The Codex, for well-understood reasons, uses both the metric and the imperial systems, but the metric system has been given priority. At the end of last year, the Council on Pharmacy and Chemistry of the American Medical Association authorised the exclusive use of the metric system in all publications for which it assumes responsibility. There is evidence that in America the use of the metric system in prescription writing is increasinig. One pharmacy in Chicago reports that 75 per cent. of the prescriptions dispensed there are in metric. In this country most prescribers use the apothecaries' system, and they are likely to continue to do so until a compulsory change is made. Even the B.P. retains the imperial weights and measures for doses. Whatever may be said for the older system from the point of view of the prescriber (and the patient) there is no doubt that the pharmacist finds the metric system more easy, convenient and what is as important, nearly fool-proof."

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"PROMISCUOUS IMPORTATIONS OF LIVESTOCK"

In adhering to its policy concerning promiscuous importations of livestock the British Friesian Cattle Society aims at dispelling any misunderstanding in overseas countries. The Society will not register in its Herd Book any animal privately imported into this country merely on the ground that it is entered or is eligible for entry in an overseas Herd Book.

Breed societies have a big responsibility in such matters and cannot be expected to forego precautions ensuring, as far as possible, that blood from other countries is likely to maintain or improve our own standards. We presume this decision does not imply general hostility to importations, but merely reserves the right to insist that any stock imported shall have other recommendations as well as registration if it, or its progeny, is to secure entry in the Herd Book of this country.—*Farmer and Stock-Breeder.*

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UNDULANT FEVER IN CHILE

In a recent article (*Bol. Of. San. Panamericana,* **22**, 400, 1943) Enrique Onetto, director of the Diagnostic Laboratory of the Chile Bacteriological Institute, discusses the historical aspects and present state of undulant fever in Chile. The disease was first diagnosed in that country in 1931, when it was found near Santiago, and in 1940 a new focus was discovered in the northern part of the country. The commonest variety is *Brucella melitensis,* though *Br. abortus* has also been isolated in cattle. The infection is most prevalent in the southern part of Chile. Since 1936 the Huddleson reaction has been performed systematically on all the sera received for the Widal reaction. In 1936 also the Department of Health created a permanent commission for the study of brucellosis composed of medical men, bacteriologists and veterinarians.—*Nature.*

CORRESPONDENCE

The Editor will be glad to receive items of professional interest for inclusion in these columns.

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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THE LOVEDAY REPORT AND THE PROFESSION

Sir,—Judging from the tone of the majority of letters in your columns recently, there would appear to be a grave danger that the Loveday Report may be laid aside without due consideration on the sole grounds of its alleged destruction of our so-called one-portal system. This allegation doubtless makes a convenient slogan for the opponents of the report, and may alarm the uninformed, but like so many political war cries it does not bear close examination.

Just what does our present system give us compared with the Loveday proposals? All are aware that the R.C.V.S. has complete control over our professional examinations but it has not been made equally clear that it has no such control over the quality of the teaching leading up to these examinations. The present colleges, it is true, are affiliated to the R.C.V.S., but it was with considerable surprise that I heard recently that the R.C.V.S. has no power to disaffiliate any that does not reach the required standard. In case others should have shared my ignorance on this point, I feel it should be stressed as it could constitute a great stumbling block to any educational reform.

So far, then, from being attacked on its handling of this problem I consider the Loveday Committee is to be congratulated upon finding so sound a solution to its many difficulties. Its proposals give the R.C.V.S. a considerably higher status with access to the Privy Council. A wide degree of control over the examination standard is retained in its hands and an equally wide degree of control is given over the actual standard of teaching. The facilities for this latter would be enormously improved and moreover with some feeling of competition between the various centres of education there would be a great incentive to reach higher than the bare minimum necessary to qualify.

Disciplinary powers within the profession are not altered.

Where then is there any cause for alarm?

The only danger, that of the unqualified practitioner, has always been with us. The Loveday Committee has not neglected this question and has made it quite clear that it must be thoroughly investigated before the report can be implemented in full. The Government has indeed promised this investigation, though we are hardly likely to get satisfactory legislation on the matter if we refuse even to consider the opportunity now before us of making the veterinary profession a more vital force in the service of science and agriculture.

It is not possible to consider in detail other aspects of the report within the bounds of a letter and excerpts isolated from their context such as we have seen lately are clearly valueless. Sufficient unto the fact that we have before us a fine piece of constructive planning and an unprecedented opportunity for our own advancement both in scientific knowledge and in public recognition.

Do not, then, in our anxiety to lock imaginary back doors into the profession, let us gain a reputation for such unenterprising timidity that we must keep the front door on the chain at the same time, for in so doing we shall discourage from entry not only the best of our potential graduates but also those of our friends who could be most helpful and who should be most welcome.

Yours faithfully,

32, Bushey Grove Road, Watford, Herts. MARION J. FREAK.

June 17th, 1944.

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Sir,—There must be very few in our profession who would not welcome the collaboration with the university both in an academic and in a wider sense. At the same time it has been demonstrated that this can be brought about without any interference with the one-portal system, and without in any way weakening the power of the Council which is elected by the members of the profession.

The one-portal system of entry is certainly the envy of several other professions. It should be possible for our educational system to be an integral part of the university, and the maintenance and development of the status of our profession safeguarded.

There appears to be no guarantee that the universities mentioned will grant the veterinary school the full status of faculty. In fact, there is some evidence to suggest that the veterinary departments might be subordinate to a chief of a medical or agricultural department.

Liverpool trains students for internal and external examinations and it should not be impossible for any university which desires to teach veterinary science to do likewise.

The Council of the Royal College does at present exempt degree students from certain other examinations for the diploma. The present system functions well at Liverpool and there is no reason why it could not function similarly at other universities if they wish to take up the work.

A point made by Dr. Wooldridge in his letter of May 22nd is that of generous expenditure. The profession will certainly appreciate and perhaps deserve more generous financial support, but it would be extremely unwise for us to lose the leadership and control of our small profession in our anxiety for this so welcome financial help.

Yours faithfully,

2/4, Clifton Road, Winchester. F. H. MANLEY.

June 17th, 1944.

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Sir,—The Second Report of the Committee on Veterinary Education in Great Britain provides for "an annual output of 220 qualified persons" and proposes that 100 of these should be trained at the veterinary colleges in London and Edinburgh while 120 should be trained at university veterinary schools. The annual cost of salaries and superannuation at the two colleges in London and Edinburgh is estimated at £70,000 and at the four university veterinary schools at £100,000; maintenance costs are estimated at half the amounts required for salaries and superannuation, which brings the total annual cost for the two colleges to £105,000 and for the four universities to £150,000, or, expressed as the annual cost of each veterinary student, as £210 for the colleges and £250 for the universities. With a five years' course the training of each veterinary surgeon will cost the State £200 more at a university veterinary school than at a college.

In discussing the numbers of students the Committee says in Clause 10:—

"We do not, however, desire to adhere to our previous recommendation that the number of students at London and Edinburgh should be limited to 250 and 225 respectively, but suggest that these figures might reasonably be increased to, say, 325 and 275."

With regard to the universities it says in Clause 11:—

"It is a striking fact that from whatever point of view, the question was aproached each university reached the same conclusion, that the ideal size of a veterinary unit should provide for not more than 30 graduates annually, and possibly for as few as 25."

The universities will not be asked to sacrifice their ideals. Nevertheless, the Committee sees no reason why two veterinary colleges should not turn out as many qualified veterinary surgeons as four universities, but whereas the universities will require £250 annually for each of 600 students, the colleges will manage on £175 for each student.

The Report in Clause 14 says:—

"We are convinced that the best training can be secured only by persuading universities to undertake responsibility for that training. Nothing short of this will give veterinary education the standing and the opportunities for development which the increased and still increasing importance of the profession to the national economy deserves and requires."

Had the Committee recommended that the London and Edinburgh Colleges should be incorporated in the Universities of London and Edinburgh and placed on a par with the proposed university veterinary schools the Committee's integrity could not have been questioned.

The present proposals are so heavily in favour of the university veterinary schools and in favour of their graduates, who will also have the privilege of a degree not possessed by their less fortunate colleagues from the colleges, that if these be adopted the inevitable result would be the division of our profession into two groups, one privileged from the start and the other not. Surely this is not in the best interests of veterinary science; the basis for the training of the undergraduate at whatever centre, in so far as this can be planned, should be equally good. For the Committee to have proposed conditions which will lower the status and degrade the teaching of two centres of veterinary education is a grave disservice. The Committee's recommendations if carried out are eminently calculated to justify their intuitive conclusion

"that the best possible training for veterinary surgeons can be secured only by persuading universities to undertake responsibility for that training."

Yours faithfully,

Moredun Institute, Gilmerton. Midlothian. A. D. McEWEN.

June 20th, 1944.

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"VIS UNITA FORTIOR"

Sir,—It is unfortunate that in this the Centenary of the Royal College of Veterinary Surgeons there should be so much disagreement and dissension in our ranks. This, I submit, is largely due to certain sectional organisations, cliques and individuals who have presumed to speak and negotiate for and on behalf of the veterinary profession *as a whole*.

This is, of course, the prerogative and duty of the Council of the Royal College of Veterinary Surgeons, which alone is authorised by Royal Charter and elected by *all* the members of the R.C.V.S. to represent them.

In view of the serious position in which we now find ourselves, all independent negotiations should cease and, when necessary, be repudiated by the Council of the Royal College of Veterinary Surgeons, which alone is competent to develop and protect the rights and privileges of the veterinary profession *as a whole*.

Yours faithfully,

Little Common, Sussex. L. E. W. BEVAN.

June 18th, 1944.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
May 16th to 31st, 1944 ...	8	2	1	1	59
Corresponding period in—					
1943 ...	9	—	—	1	11
1942 ...	18	4	—	5	22
1941 ...	28	35	1	4	49
Total Jan. 1st to May 31, 1944	102	21	6	59	325
Corresponding period in—					
1943 ...	143	10	5	98	214
1942 ...	144	16	26	115	186
1941 ...	244	253	8	129	724

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified free from Tuberculosis as at May 31st, 1944, was as follows:—

ENGLAND	WALES	SCOTLAND	TOTAL (GREAT BRITAIN)
4,087	8,558	3,644	16,289